

Editorial

An important aim of the symposia organized by the Netherlands Ecological Society has always been to give an impetus to discussion of interdisciplinary topics of a more or less applied ecological character. A theme derived from ecosystem studies on nutrient cycling concerns the decomposition and mineralization process and there is currently an intensified interest in this subject especially in the context of environmental perturbations which are imposed on this process. In the Netherlands this increasing awareness of the irreversibility and long-lasting impact of deterioration and pollution of soils and sediments has an important influence on environmental policies and research, which has resulted in the initiation of "The Netherlands Integrated Soil Research Programme". In this context the N.E.S. organized this symposium on decomposition processes in terrestrial and aquatic ecosystems, which was held in Amsterdam in September 1988. This special volume of *Biogeochemistry* covers a selection of the papers presented at the meeting.

In the opening paper Eijssackers & Zehnder gave an overview of the questions raised during the meeting: what are the general principles of decomposition processes, what are these processes like and by which factors are they carried out; under what conditions are the different processes active and are there any differences between terrestrial and aquatic soils. They concluded that there are only small differences in the structure of the decomposition processes between terrestrial and aquatic soils.

The contribution of soil animals to organic matter decomposition and nitrogen mineralization in natural and agro-ecosystems was discussed by Verhoef & Brussaard. They pointed to a rather similar faunal contribution to nitrogen mobilization in different ecosystems, such as prairies, forests and arable farming systems. They further discussed the influences of abiotic factors and management on this value and set out lines for further research such as the development of dynamic models, studies concerning the effects of perturbation and the integration of the study of below-ground food webs with ecological theories.

The significance of physical soil factors, such as texture and structure, for the decomposition of organic material by microorganisms was demonstrated by means of comparative experimental research and model simulation (Van Veen). The decomposition processes were discussed in the perspective of food web-relations and nutrient cycles in the soil.

Subsequent to the paper on the decomposition in the semi-terrestrial salt marsh ecosystems (not in the volume) Van der Velde & Kok discussed the decomposition processes in aquatic ecosystems. They divided the decomposition of nymphaeid aquatic macrophytes into three phases: in the first phase the leaves are confronted with specialized microorganisms and herbivores in combination with ageing- and resorption-processes. During the second (debris) phase fragmentation takes place together with leaching, whereas in the final

(detritus) phase there is no recognizable leaf structure. They quantified the role of microorganisms and herbivores and discussed the effects of acidification.

After a paper on the decomposition processes in marine and freshwater soils, in which stratification of bacterial activity was discussed in relation to the availability of light, electron acceptors and electron donors (not in this volume), the meeting was closed by a paper on the molecular characteristics of organic matter in ecosystems by Moers, Boon & de Leeuw. They showed that the key to understanding the role of organic substances in ecosystems is the molecular characterization of organic material. This characterization is possible by means of mass spectrometry. Examples are given for the tracing of enzymatic and microbial modification processes of plant, algal and fungal cell walls.

The meeting on which this volume is based strengthened the need for cooperation between the participants, both speakers and listeners. As editors we hope that this volume will serve the same purpose to its readers.

Finally we like to thank the referees who read and commented on the manuscripts.

Herman A. Verhoef
Elly P.H. Best